IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of	:	
CASTLEBERRY	:	
Serial No.: 10/670,531	:	Examiner Nguyen
Filed: September 26, 2003	:	Group Art Unit 3643
For: AGRICULTURAL FOAM GROWING MATERIAL	:	

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

TABLE OF CONTENTS

TABLE OF CASES

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REAL PARTY IN INTEREST

The real party in interest is the appellant, Wayne Castleberry.

RELATED APPEALS AND INTERFERENCES

Applicant has sought redress twice before by this Board with regard to the present application, but on each previous occasion, prosecution has been re-opened at the behest of the Examiner after filing of Applicant's Appeal Brief but prior to the deadline for receipt of the Examiner's Brief. Except for Applicant's two previous appeals, there are no appeals, interferences

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or judicial proceedings known to appellant or its legal representatives which may be related to, directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

STATUS OF THE CLAIMS

Claims 1-23, 25 and 26 are rejected under 35 USC 103(a) as unpatentable over Pruitt et al. U.S. Patent Number 3,373,009 (hereinafter Pruitt '009) in view of Heller et al. U.S. Patent Number 4,469,502 (hereinafter Heller '502). Claims 1-23, and 25-26 are being appealed.

STATUS OF THE AMENDMENTS

This is the third Appeal Brief filed in the instant case without any resolution.

This case was filed September 26, 2003. The Examiner issued a final rejection on March 4, 2005 rejecting all claims. A Response (no amendments were made to the claims) was made after the final rejection presenting arguments as to why the combined cited references were not valid prior art and a Notice of Appeal was filed. The Response was not entered as the Examiner held that the purposed amendment was not deemed to place the application in better form for appeal by materially or simplifying the issued for appeal. The first Appeal Brief was filed November 2, 2005 and prior to the time for filing the Examiner's Brief, the Examiner reopened examination, citing purported new art. The Examiner issued a first rejection on April 13, 2006 which was responded to by an Amendment on October 13, 2006 amending claims 16 and 20. The Examiner issued a second final rejection on January 10, 2007, again rejecting the claims currently in the case. An amendment was presented on July 10, 2007 amending claim 9 after the second final rejection

presenting arguments as to why the combined cited references were not valid prior art and a second Notice of Appeal filed. An Advisory Action of July 18, 2007 treated the Amendment as a Request for Reconsideration and stated that the Amendment of July 10, 2007 did not place the application in condition for allowance in view of the cited reference. A second Appeal Brief was filed October 10, 2007 and prior to the time for filing the Examiner's Brief, examination was re-opened with another Office Action of January 7, 2008, citing new prior art. A Response was filed April 7, 2008 and a final Office Action was issued on July 14, 2008. A Response to the final Office Action was filed November 14, 2008. This third Brief is being filed subsequent Applicant's Response to the Examiner's second and final rejection. In the Examiner's Advisory Action of November 26, 2008, the Examiner states that Applicant's Response of November 11, 2008 does not place the case in condition for allowance as the arguments were non-persuasive.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The subject matter of independent claim 1 is directed toward a horticultural growing medium having a flexible diphenylmethane diisocyanate foam material without filler material (p. 6; lns. 4, 5) having a cation exchange capacity ranging from about 1.0 to about 1.5 (p. 8, lns. 2, 3) capable of supporting plant growth (p. 8, lns. 4-10).

The subject matter of dependent claim 2 is directed toward the horticultural growing medium of claim 1, wherein the exchange capacity is about 1.25 (p. 8, ln. 4).

The subject matter of dependent claim 3 is directed toward the horticultural growing medium of claim 1, wherein the diphenylmethane diisocyanate foam material is taken from a group consisting of polymeric diphenylmethane diisocyanate, crude diphenylmethane diisocyanate, 4,4'-,

2,4'-, 2,2'-diphenylmethane diisocyanate (p. 6, lns. 10-15).

The subject matter of dependent claim 4 is directed toward the horticultural growing medium of claim 1, wherein the diphenylmethane diisocyanate foam material is polymeric diphenylmethane diisocyanate (p. 6, ln. 14).

The subject matter of dependent claim 5 is directed toward the horticultural growing medium of claim 1, wherein the diphenylmethane diisocyanate foam material is one or a mixture of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), polymeric MDI, crude MDI, namely, products of crude diaminodiphenyl methane or a mixture of the same (p. 6, lns. 13-15).

The subject matter of dependent claim 6 is directed toward the horticultural growing medium of claim 1, wherein the foam material has a neutral pH ranging from 6.8 to 7.8 (p. 7, ln. 1; p. 8, ln. 9).

The subject matter of dependent claim 7 is directed toward the horticultural growing medium of claim 1, wherein the foam material is highly porous and maintains a 60 to 40 air to water ratio (p. 7, lns. 5-10).

The subject matter of dependent claim 8 is directed toward the horticultural growing medium of claim 1, wherein the foam material has at least 50% of its pores by foam volume ranging in size between 10 and 200 microns (p. 7, lns. 15, 16).

The subject matter of dependent claim 9 is directed toward the horticultural growing medium of claim 1, wherein the foam material has about 50% of its pores by foam volume ranging in size from about 40 to about 90 microns (p. 7, ln. 16).

The subject matter of dependent claim 10 is directed toward the horticultural growing medium of claim 1, wherein the foam material has pores ranging from 20% to about 25% by foam

volume which range in size between about 0.2 microns to about 10 microns (p. 7, lns. 18-20).

The subject matter of dependent claim 11 is directed toward the horticultural growing medium of claim 1, wherein the foam material has pores ranging from about 25% to about 35% by foam volume which range in size between about 300 microns to about 800 microns (p. 7, lns. 21, 22).

The subject matter of dependent claim 12 is directed toward the horticultural growing medium of claim 1, wherein the foam material is substantially sterile (p. 6, ln. 22 – p. 7, ln. 1).

The subject matter of dependent claim 13 is directed toward the horticultural growing medium of claim 1, wherein the foam material has pores of about 30% by foam volume which range in size between about 300 microns to about 800 microns (p. 7, lns. 21, 22).

The subject matter of dependent claim 14 is directed toward the horticultural growing medium of claim 1, wherein the foam material has a total porosity ranging from 85% to 95% (p. 7, ln. 4).

The subject matter of dependent claim 15 is directed toward the horticultural growing medium of claim 1, wherein the foam material has a total porosity of about 90% to 92% (p. 7, lns. 4-5).

The subject matter of independent claim 16 is directed toward a horticultural growing medium constructed of a sterile hydrophilic unfilled foam material (p. 6, ln. 22; p. 7, ln. 1) made of diphenylmethane diisocyanate (p. 6, lns. 12-15) having at least 50% of its pores by foam volume ranging in size between 10 and 200 microns (p. 7, lns. 15, 16) with a cation exchange capacity ranging from about 1.0 to about 1.5 (p. 8, lns. 2-4), the foam material having a total porosity ranging from about 85% to about 95% (p. 7, ln. 4) and a neutral pH ranging from 6.8 to 7.8 (p. 7,

ln. 1; p. 8, ln. 9) capable of supporting plant growth (pg. 8, lns. 4-10).

The subject matter of dependent claim 17 is directed toward the horticultural growing medium of claim 16, wherein the foam material is at least one diphenylmethane diisocyanate taken from a group consisting of crude, polymeric, 4,4'-, 2,4'- and 2,2'-diphenylmethane diisocyanate (p. 6, lns. 10-15).

The subject matter of dependent claim 18 is directed toward the horticultural growing medium of claim 16, wherein the foam material is polymeric diphenylmethane diisocyanate (p. 6, ln. 14).

The subject matter of dependent claim 19 is directed toward the horticultural growing medium of claim 16, wherein the foam material is one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, polymeric MDI or a mixture of the same (p 6, lns. 13-15).

The subject matter of independent claim 20 is directed toward a horticultural growing medium constructed of a substantially sterile unfilled foam material (p. 6, ln. 22; p. 7, ln. 1) made of polymeric diphenylmethane diisocyanate taken from a group consisting of one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, products of crude diaminodiphenyl methane including polymeric MDI or a mixture of the same (p. 6, lns. 12-15), having at least 50% of its pores ranging in size between 10 and 200 microns (p. 7, lns. 15, 16) with a cation exchange capacity ranging from about 1.0 to about 1.5 (p. 8, lns. 2-4), with a total porosity ranging from about 90% to about 92% (p. 7, lns. 4, 5) and a neutral pH from 6.8 to 7.8 (p. 7, ln. 1), capable of supporting plant growth (pg. 8, lns. 4-10).

The subject matter of dependent claim 21 is directed toward the horticultural growing

medium of claim 20, wherein the foam material is a sheet with seeds secured thereto (p. 9, lns. 4-5 & Figure 5).

The subject matter of dependent claim 22 is directed toward the horticultural growing medium of claim 20, wherein the foam material is a shaped block with an aperture cut therein (p. 9, ln 1).

The subject matter of dependent claim 23 is directed toward the horticultural growing medium of claim 20, wherein the cation exchange capacity is about 1.0 (p. 8, ln. 2).

The subject matter of independent claim 25 is directed toward a horticultural growing medium constructed of a hydrophilic, substantially sterile (p. 6, ln. 22 – p. 7, ln. 1) diphenylmethane diisocyanate foam material without filler material taken from a group consisting of polymeric diphenylmethane diisocyanate, crude diphenylmethane diisocyanate, 4,4'-, 2,4'-, 2,2'-diphenylmethane diisocyanate (p. 6, lns. 13-15) and having a neutral pH ranging from 6.8 to 7.8 (p. 7, ln. 1), the material having a cation exchange capacity ranging from about 1.0 to about 1.5 (p. 8, lns. 2-3), capable of supporting plant growth (pg. 8, lns. 4-10).

The subject matter of independent claim 26 is directed toward a horticultural growing medium constructed of a hydrophilic flexible (p. 6, ln. 5) sterile (p. 6, ln. 22 – p. 7, ln. 1) foam material made of diphenylmethane diisocyanate the foam material being taken from a group consisting of crude, polymeric, 4,4'-, 2,4'- and 2,2'-diphenylmethane diisocyanate (p. 6, lns. 13-15) having at least 50% of its pores by foam volume ranging in size between 10 and 200 microns (p. 7, lns. 15-16) with a cation exchange capacity ranging from about 1.0 to about 1.5 (p. 8, lns. 2-3), the foam material having a total porosity ranging from about 85% to about 95% (p. 7, lns. 4); the horticultural growing medium being capable of supporting plant growth (pg. 8, lns. 4-10).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

(A) Whether the invention as defined in Claims 1-23, and 25-26 is obvious and therefore unpatentable under 35 USC 103(a) over the cited prior art references to Pruitt '009 in view of Heller '502.

ARGUMENT

(A) The Examiner's rejection of Claims 1-23, and 25-26 under 35 USC 103(a) as unpatentable over Pruitt '009 in view of Heller '502 is incorrect and should be reversed.

The claims of the present invention are directed toward a horticultural growing medium capable of supporting plant growth in the form of a **diphenylmethane diisocyanate unfilled and substantially sterile foam material** having a cation exchange capacity (C.E.C.) ranging from 1.0 to about 1.5 milliequivalents (meq)/100 g. The material has pore sizes of various ranges in various percentages and a total porosity ranging from 85% to 95% and a neutral pH ranging from 6.8 to 7.8. As was made clear in the application, the term sterile (Independent Claims 16, 20, 25, and 26) is not used in its medical sense, but instead is used as is commonly understood in the horticultural industry to indicate a growth medium that is free from plant disease, microbes, fungus, insects, disease, algae, and animal life. One distinction between the foam growth medium of the instant invention and the prior art is its ability to support plant growth without use of adjuvants or fillers. In this age of transnational commerce, where live plants may be flown out from a facility in China, Chile, or The Netherlands and available for purchase from the local garden center in any large city in the United States, a growth medium that does not support deleterious microbial growth is

crucial. This is particularly true with regard to soil-borne diseases, for example Mad Cow disease and its deadly to humans variant, Creutzfeldt-Jakob. With particular regard to the Canadian Mad Cow disease outbreak in 2003, a commonly unreported fact was that the origins of the outbreak were thought to be due to the disease vector being carried in dirt embedded in the shoe soles of travelers between Great Britain, where at the time there was an active outbreak, and Canada. Previously known growth media utilizing foam also require fillers, as for example soil, perlite, vermiculite, limestone, and the like, and therefore are subject to the risks discussed above. The instant invention does not contain filler materials and is sterile. It therefore solves a pressing need for a safe means of conducting international commerce.

As noted by the Examiner and is clear from a review of the Pruitt '009 patent, the Pruitt reference does not teach or mention the use of foam material diphenylmethane diisocyanate. Indeed this is not listed in the list of suitable diisocanates. Notwithstanding the Examiner's assertion that Pruitt '009 does not contain a filler material because "no filler [is] listed such as peat, ground scrap foam, etc." (Examiner's July 14, 2008 Office Action, pg 2) conveniently ignoring the following Examples listed in the Pruitt '009 patent: Example 1 (insoluble salts including dolomitic limestone and the additives perlite and Dowex 4 nitrate); Examples 2, 3 (insoluble salts and the additive Dowex 4 nitrate); Example 4 (insoluble salts including dolomitic limestone and the additive vermiculite); Example 5 (insoluble salts including dolomitic limestone and the additive perlite); Example 6 (insoluble salts including the additives Dowex 4-nitrate and perlite); Examples 6, 7 (insoluble salts and the additives Dowex 4-nitrate and perlite); Examples 6-10 (insoluble salts and the additive Dowex 4-nitrate); and Examples 10-12 (insoluble salts and the additive Dowex 4-nitrate). Applicant would assert that the Examiner has made an improper conclusion contrary to

the disclosure of the Pruitt '009 reference. The absence of any particular statement does not substantiate the truth of its opposite. This is, in essence, a disclosure by omission that cannot be other than pure speculation or teaching by hindsight because there are literally a nearly infinite number of features *not* disclosed in Pruitt '009. Instead, a reference must teach a claimed feature. In Pruitt '009, the absence of text regarding an absence of fillers, without an additional affirmative statement that no fillers are required, cannot be construed to mean that the technology can be used without fillers.

As previously noted, Pruitt '009 in fact requires filler material in order to be operative. Column 8, lines 35 through 42 of Pruitt state in part, "the preferred method of preparing a **nutrient charged foam matrix according to the present invention** is the method known the polyurethane art as the "one shot technique wherein **polyester resin** ... [a] **nutrient mixture, moisture retainer or other additaments** ... are mixed together to produce a polyurethane **foam matrix** containing leach resistant nutrients (emphasis added). *To whit*, "[i]t is considered that the foam must contain at least 20 percent open-cell structure to permit unhindered root growth and contact with **the nutrients imbedded therein**" (emphasis added, col 3 ln 43-46), "the preferred method of preparing a **nutrient charged foam matrix** ... wherein ... **nutrient mixture ... or other additaments ... are mixed together** to produce a polyurethane **foam matrix containing leach resistant nutrients**" (col 8 lns 35-42), "**insoluble salt mixture**" (emphasis added, col 12 Ex 1, col 15 Ex 7), "**[d]olomitic limestone**" (emphasis added, col 12 Ex 1, col 14 Ex 4, col 17 Ex 11 & 12), "**CaSO4**" (calcium sulfate) (emphasis added, col 14 Ex 3 & 4), "**horticultural grade perlite**" (emphasis added, col 13 ln 21-22, col 14 ln 70-71), "**perlite**" (emphasis added, col 12 Ex 1, col 14 Ex 5, col 15 Ex 6), and "**vermiculite**" (emphasis added, col 14 Ex 4), One having ordinary skill in

the art would know that the "nutrient mixture" disclosed in the '009 patent is in fact a filler material and Pruitt '009 is inoperative without same. Pruitt '009 states that "'artificial'" "non-soil media for growing plants" are "notable for their failure" (col 1 ln 41-43). In light of this past experience, it was an unexpected and unpredictable result that diphenylmethane diisocyanate foam by itself would produce a viable unfilled growth media. Furthermore as noted by the Examiner, Pruitt "009 does not state the use of diphenylmethane diisocyanate

Heller '502 requires "mineral fertilizers **embedded** in polyurethanes" (col 1 ln 10-11). Heller '502 is essentially, a long acting **fertilizer comprising a foam coating encapsulating nutrients that are slowly released over time** ("[c]oating ... fertilizers with ... polyurethanes", col 5 ln 3-5). As such, a critical component of the mineral fertilizer composition is a high C.E.C. that ensures binding of the nutrients thereto due to their highly ionic character. The Heller '502 "invention ... relates to a process for supplying plants with nutrients uniformly and **over a long period of time** by the addition of nutrient-charged synthetic resin ion exchangers and mineral fertilizers" (col 3 ln 63-66). See generally, col 1 ln 15-40. In contrast, the growth medium of the instant invention includes a C.E.C. ranging from only about 1.0 to about 1.5 milliequivalents (meq)/100 g that ensures any nutrients are **immediately** available to the plant.

It should also be noted that the '009 Pruitt patent is discussed in Heller '502 (the second cited reference on col 3 lns 3-16) recognizing that Pruitt '009 has imbedded filler material:

> "U.S. Pat. No. 3,373,009 describes, for example, foams which are suitable as plant growth media and consist of a water-insoluble polyurethane-based matrix material which is at least partially open-pored and in which, as plant nutrients, inorganic

fertiliser salts of limited water solubility and anion exchangers charged with nitrate ions **are embedded**. Although these polyurethane foams containing plant nutrients are suitable as large pieces of inert materials for plant growth without soil, they are unsuitable as universally usable fertilisers, since the release of the nutrients from these polyurethane foams when they are used as fertilisers is hindered to an excessive extent by diffusion." (emphasis added)

Heller '502 uses mineral fertilizers which have a particle size < 500 μm preferably <100 μm, particularly preferably <50 μm which have been coated with massive polyurethanes having a water-absorbing capacity adapted to the water solubility of the mineral fertilizer.

By its very nature as a product designed for sequestering nutrients, Heller '502, like Pruitt '009, also **requires** the use of filler materials. Heller "relates to a process for supplying plants with nutrients uniformly and over a long period of time by the addition of nutrient-charged synthetic resin ion exchangers and **mineral fertilizers** to the culture medium " (col 3 ln 64-67, emphasis added). See also, Tables 3 & 5, and Example 7.

For the above discussed reasons, neither Pruitt '009 nor Heller '502, singularly or in combination, are references which teach or suggest the present invention. Furthermore, Pruitt '009 and Heller '502 cannot be combined to obviate the present invention.

Since the present invention does not introduce any fillers to the matrix (without filler material, unfilled foam material), there is a much lower likelihood of contaminating the matrix for the plants and thereby rendering it un-sterile. Sterile materials conform to agricultural legal requirements currently in place thus making it easier to ship plants and the media materials across

national borders. **Neither of the cited references teaches the use of an unfilled sterile foam material with a C.E.C. ranging from 1.0 to 1.5, nor a sterile foam material** which has been previously noted as a necessary requirement when shipping plants internationally. Neither of cited references has optimum pore sizes and porosity for fluid transfer to the plant, or 60 to 40 air to water ratio, or a pore size of over 80%. It is not obvious how to obtain air water ratios without the use of fillers. Furthermore, as known by those skilled in the art, when one puts additives in foam, pore size is exceptionally difficult to control. Thus pore size is not inherent. Furthermore chemical reactions that take place in filled foam are such that sterility is not inherent in filled foams.

As previously noted, the claim of pore size and porosity is a further description of the unique unfilled foam with unexpected properties.

The present invention uses a unique **unfilled** foam with unexpected properties that support plant growth.

Furthermore, the un-filled polyurethane foam of the present invention has the required properties of a suitable growth media, pH, porosity, pore size, C.E.C. ranges and foam material. C.E.C. is not predictable as it depends upon the structure of molecules that make the foam. Different ingredients in making foam will give different C.E.C. Density also changes the C.E.C. as do the foaming ingredients and the thousands of variables of additives, each with a different C.E.C.

In cases which are similar to the present circumstances, the courts have ruled that beyond looking at the prior art to determine if it suggests doing what the inventor has done, one must consider if the prior art provides an expectation of succeeding in the endeavor. *In re Dow Chem.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), "Both the suggestion and the

expectation of success must be founded in the prior art, not in the applicant's disclosure." Id. As noted by the court in the case of *In re Clinton*, "Obviousness does not require absolute predictability, but a reasonable expectation of success is necessary." *In re Clinton*, 527 F.2d 1226, 1228, 188 U.S.P.Q. 365, 367 (C.C.P.A.1976).

As noted by the Court in the case of *In re Gordon*, the mere fact that a prior art reference could be modified to achieve the claimed invention does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir.1984); see also *In re Laskowski*, 871 F.2d 115, 117, 10 U.S.P.Q.2d 1397, 1398 (Fed. Cir. 1989), and *Ex parte Levengood*, 28 U.S.P.Q.2d 1300, 1302 (Bd. Pat. App. & Int. 1993). Applicants respectfully submit that nowhere in the art of record is there any suggestion to arrive at the claimed novel composition of the present invention.

The court in *In re Baird*, 29 USPQ2d 1550 (Fed. Cir. 1994), held that "The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious." The *Baird* court further held that a disclosure to numerous compounds does not render obvious a claim to three compounds, particularly when that disclosure indicates a preference leading away from the claimed compounds.

As previously argued, none of the cited references singularly or in combination suggest teach or obviate the present invention and indeed cannot be combined. The examiner has engaged in hindsight application, a prohibited refection since *John Deere* to combine the cited prior art references against the present invention.

The present invention uses a unique foam with unexpected properties that support plant growth.

Applicants respectfully submit that nowhere in the art of record is there any teaching to arrive at the claimed novel composition of the present invention. Reversal thereof by the Honorable Board of Patent Appeals and Interferences is therefore requested and is earnestly solicited.

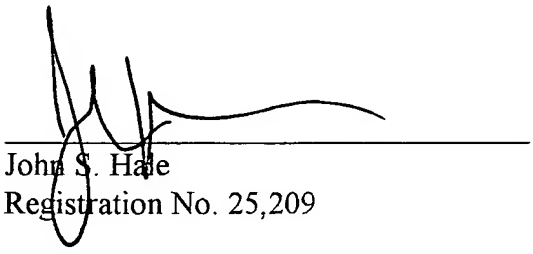
SUMMARY OF ARGUMENT

The respective grounds of final rejection of the claims of this application under 35 USC 103(a) are incorrect for the reasons advanced above. Reversal thereof by the Honorable Board of Patent Appeals and Interferences is therefore requested and is earnestly solicited.

A check has been previously submitted for a prior appeal brief. That check covers the cost of filing this Brief. If any additional fees are incurred, kindly charge the same to our Deposit Account No. 07-1340.

Respectfully submitted,

GIPPLE & HALE



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CLAIMS APPENDIX

1. A horticultural growing medium comprising:

a flexible diphenylmethane diisocyanate foam material without filler material having a cation exchange capacity ranging from about 1.0 to about 1.5,

said horticultural growing medium being capable of supporting plant growth.

2. The horticultural growing medium of claim 1, wherein said cation exchange capacity is about 1.25.

3. The horticultural growing medium of claim 1, wherein said diphenylmethane diisocyanate foam material is taken from a group consisting of polymeric diphenylmethane diisocyanate, crude diphenylmethane diisocyanate, 4,4'-, 2,4'-, 2,2'-diphenylmethane diisocyanate.

4. The horticultural growing medium of claim 1, wherein said diphenylmethane diisocyanate foam material is polymeric diphenylmethane diisocyanate.

5. The horticultural growing medium of claim 1, wherein said diphenylmethane diisocyanate foam material is one or a mixture of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), polymeric MDI, crude MDI, namely, products of crude diaminodiphenyl methane or a mixture of the same

6. The horticultural growing medium of claim 1, wherein said foam material has a neutral pH ranging from 6.8 to 7.8.

7. The horticultural growing medium of claim 1, wherein said foam material is highly porous and maintains a 60 to 40 air to water ratio.

8. The horticultural growing medium of claim 1, wherein said foam material has at least 50% of its pores by foam volume ranging in size between 10 and 200 microns.

9. The horticultural growing medium of claim 1, wherein said foam material has about 50% of its pores by foam volume ranging in size from about 40 to about 90 microns.

10. The horticultural growing medium of claim 1, wherein said foam material has pores ranging from 20% to about 25% by foam volume which range in size between about 0.2 microns to about 10 microns.

11. The horticultural growing medium of claim 1, wherein said foam material has pores ranging from about 25% to about 35% by foam volume which range in size between about 300 microns to about 800 microns.

12. The horticultural growing medium of claim 1, wherein said foam material is substantially sterile.

13. The horticultural growing medium of claim 1, wherein said foam material has pores of about 30% by foam volume which range in size between about 300 microns to about 800 microns.

14. The horticultural growing medium of claim 1 wherein said foam material has a total porosity ranging from 85% to 95%.

15. The horticultural growing medium of claim 1 wherein said foam material has a total porosity of about 90% to 92%.

16. A horticultural growing medium comprising:

a sterile hydrophilic unfilled foam material made of diphenylmethane diisocyanate having at least 50% of its pores by foam volume ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5, said foam material having a total porosity

ranging from about 85% to about 95% and a neutral pH ranging from 6.8 to 7.8;

said horticultural growing medium being capable of supporting plant growth.

17. The horticultural growing medium of claim 16, wherein said foam material is at least one diphenylmethane diisocyanate taken from a group consisting of crude, polymeric, 4,4'-, 2,4'- and 2,2'-diphenylmethane diisocyanate.

18. The horticultural growing medium of claim 16, wherein said foam material is polymeric diphenylmethane diisocyanate.

19. The horticultural growing medium of claim 16, wherein said foam material is one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, polymeric MDI or a mixture of the same.

20. A horticultural growing medium comprising:

a substantially sterile unfilled foam material made of polymeric diphenylmethane diisocyanate taken from a group consisting of one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, products of crude diaminodiphenyl methane including polymeric MDI or a mixture of the same, having at least 50 of its pores ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5, with a total porosity ranging from about 90% to about 92% and a neutral pH from 6.8 to 7.8,

said horticultural growing medium being capable of supporting plant growth.

21. A horticultural growing medium as claimed in claim 20 wherein said foam material is a sheet with seeds secured thereto.

22. A horticultural growing medium as claimed in claim 20 wherein said foam material is a shaped block with an aperture cut therein.

23. A horticultural growing medium as claimed in claim 20 wherein said cation exchange capacity is about 1.0.

24. (Canceled)

25. A horticultural growing medium comprising:

a hydrophilic, substantially sterile diphenylmethane diisocyanate foam material without filler material taken from a group consisting of polymeric diphenylmethane diisocyanate, crude diphenylmethane diisocyanate, 4,4'-, 2,4'-, 2,2'-diphenylmethane diisocyanate and having a neutral pH ranging from 6.8 to 7.8, said material having a cation exchange capacity ranging from about 1.0 to about 1.5,

said horticultural growing medium being capable of supporting plant growth.

26. A horticultural growing medium comprising:

a hydrophilic flexible sterile foam material made of diphenylmethane diisocyanate said foam material being taken from a group consisting of crude, polymeric, 4,4'-, 2,4'- and 2,2'-diphenylmethane diisocyanate having at least 50% of its pores by foam volume ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5, said foam material having a total porosity ranging from about 85% to about 95%;

said horticultural growing medium being capable of supporting plant growth.

EVIDENCE APPENDIX

There is no evidence to include in this appendix.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings to include in this appendix.